



MBG-003-10120018 Seat No. _____

B. Sc. (Sem. II) (CBCS) Examination

March / April - 2018

Statistics : S-201

[New Course]

Faculty Code : 003

Subject Code : 10120018

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions : (i) All questions carry equal marks.

(ii) Students can carry their own scientific calculator.

1 (a) Give the answer of following question : 4

- (1) If a constant 5 is added to each observation of a set, the mean is _____.
- (2) Geometric mean is a good measure of central value if the data are in _____.
- (3) When all the observations are same, then the relation between A.M., G.M. and H.M. is _____.
- (4) Sum of the deviation about mean is _____.

(b) Write any one : 2

- (1) The mean weight of a group of 20 persons was found to be 55 kg. Later it was discovered that one of them reported her weight as 45 kg which was actually 54 kg. Find the correct mean of their weights.
- (2) The mean of 10 observations is 16.5. If the mean of 4 of these 10 observations is 15, find the mean of the remaining observation.

(c) Write any one : 3

- (1) 3 students from a group of 18 students failed in the examination for the subject of physics. The marks obtained by 15 students who passed are as follows :
42, 65, 53, 75, 43, 50, 68, 57, 79, 48, 51, 61, 55, 70, 64. Find the median marks of all 18 students.
- (2) If the arithmetic mean of two numbers is 10 and their geometric mean is 8, find their Harmonic mean, also find the number.

(d) Write any one : 5

- (1) Prove that, the sum of the square of the deviations of a set of value is minimum when taken about mean.
- (2) In class of 40 students Mr. X has 3rd rank and in other class of 60 students Mr. Y has 5th rank.
Compare the result of both the students and who is better student ?

2 (a) Give the answer of following question : 4

- (1) If a constant value 5 is subtracted from each observation of a set, the variance is _____.
- (2) For a negatively skewed distribution, the correct relation between mean, median and mode is _____.
- (3) An empirical relation between standard deviation, mean deviation about mean and quartile deviation is _____.
- (4) If the quartile deviation of a series is 90, the mean deviation of the series is _____.

(b) Write any one : 2

- (1) Define Mean deviation.
- (2) The mean of variable is 10 and the c.v. is 60%.
What is the variance of the variable ?

(c) Write any one : 3

- (1) Write comparison the methods of Karl Pearsons and Bowley for determining the coefficient of skewness.
- (2) The standard deviation of 20 observation is 3.2. If their coefficient of variations is 40%, find the sum of 20 observations.

(d) Write any one : 5

- (1) Explain the types of skewness.
- (2) Find the value of variance and coefficient of variation from the following information :

$$\sum (x - 7) = 8, \sum (x - 7)^2 = 535, n = 15.$$

3 (a) Give the answer of following question : 4

- (1) For comparing year to year changes in price level, the suitable index to be used is _____.
- (2) If $\sum p_0 q_1 : \sum p_1 q_1 = 6 : 8$ then the Paasche's index will be _____.
- (3) The geometric mean of Laspeyre's and Paasche's indices is _____.
- (4) Symbolically $P_{01} \times P_{10} = 1$ stands for _____.

(b) Write any one : 2

(1) $\sum p_1 q_0 : \sum p_0 q_0 = 5 : 4$ and
 $\sum p_1 q_1 : \sum p_0 q_1 = 8 : 5$, find Fisher's index number.

(2) Why Fisher's Price Index number is an ideal Index number ?

(c) Write any one : 3

(1) Convert the following chain base index numbers into fixed base index number :

<i>Year</i>	2001	2002	2003	2004	2005
<i>Index number</i>	80	110	120	105	95

(2) 'Index number is the barometer of the economy of a country.' Elucidate this statement giving the use of Index Number.

(d) Write any one : 5

(1) If total expenditure 1750 and cost of living index number 136, then obtain the missing value for given data.

<i>Group</i>	<i>Expenditure (Rs.)</i>	<i>Index No.</i>
<i>A</i>	700	180
<i>B</i>	?	150
<i>C</i>	?	100
<i>D</i>	180	110
<i>E</i>	315	80

(2) Show that Fisher's index number satisfies both test Time Reversal Test and Factor Reversal Test.

4 (a) Give the answer of following question : 4

- (1) Seasonal variation means the variations occurring within _____.
- (2) Most frequently used mathematical model of a time series is _____.
- (3) Linear trend of a time series indicates towards _____.
- (4) Trend in a time series means _____.

(b) Write any one : 2

- (1) Write any two merits and demerits of method of moving average.
- (2) Write any two merits and demerits of method of least square.

(c) Write any one : 3

- (1) What is time series analysis ? Write its utilities.
- (2) Find 3-yearly moving average for the following data :

Year	2009	2010	2011	2012	2013
Production	12	15	18	15	16

(d) Write any one : 5

- (1) Fit a straight line trend by the least squares method and tabulate the trend for the given data :

Year	1999	2001	2003	2005	2007
Production	83	92	71	90	169

- (2) Explain components of time series in detail.

5 (a) Give the answer of following question : 4

- (1) _____ function is used to display today's date.
- (2) _____ is the formula for $\Delta^2 y_1$ in the formula of values of y .
- (3) If $y_1 = -5$, $y_2 = -1$, $y_3 = 6$ and $\Delta^2 y_2 = 4$, value of $y_4 =$ _____.
- (4) _____ function is used to calculated total in Excel.

(b) Write any one : 2

- (1) Define : Extrapolation.
- (2) Explain MS Excel function MODE() with example.

(c) Write any one : 3

- (1) If $f(0) = 2$, $f(2) = 6$, $f(3) = 10$, derive the form of $f(x)$ by Lagrange's method.
- (2) Explain different method of Interpolation and Extrapolation in brief.

(d) Write any one : 5

- (1) Obtain the number of workers earning wages between Rs. 60 and 70, by using appropriate method of interpolation for the following data :

Weekly wages (in Rs.)	20 – 40	40 – 60	60 – 80	80 – 100	100 – 120
Number of workers (in '000)	250	120	100	70	50

- (2) Find the estimated value of y when $x = 12.5$ by appropriate method, from the data given in the following table :

x	11	12	13	14
y	20	23	27	32
